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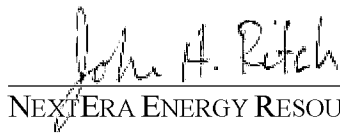
**PROJECT NO. 52373**

**REVIEW OF WHOLESALE ELECTRIC § PUBLIC UTILITY COMMISSION  
MARKET DESIGN §  
§ OF TEXAS**

**NEXTERA ENERGY RESOURCES, LLC'S COMMENTS TO  
COMMISSIONER'S QUESTIONS**

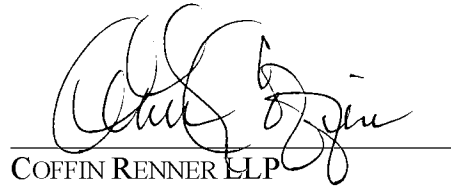
NextEra Energy Resources, LLC ("NextEra") appreciates the opportunity to participate in the Public Utility Commission of Texas's ("Commission") review of the Electric Reliability Council of Texas's ("ERCOT") wholesale electric market design and the related rule-making process. NextEra submits the attached presentation describing its proposed modifications to the wholesale electric market design and looks forward to working further with the Commission, Staff, and interested stakeholders on these revisions. As directed in Commission Staff's September 20, 2021 memorandum, an executive summary is included at the end of this filing.

Respectfully submitted



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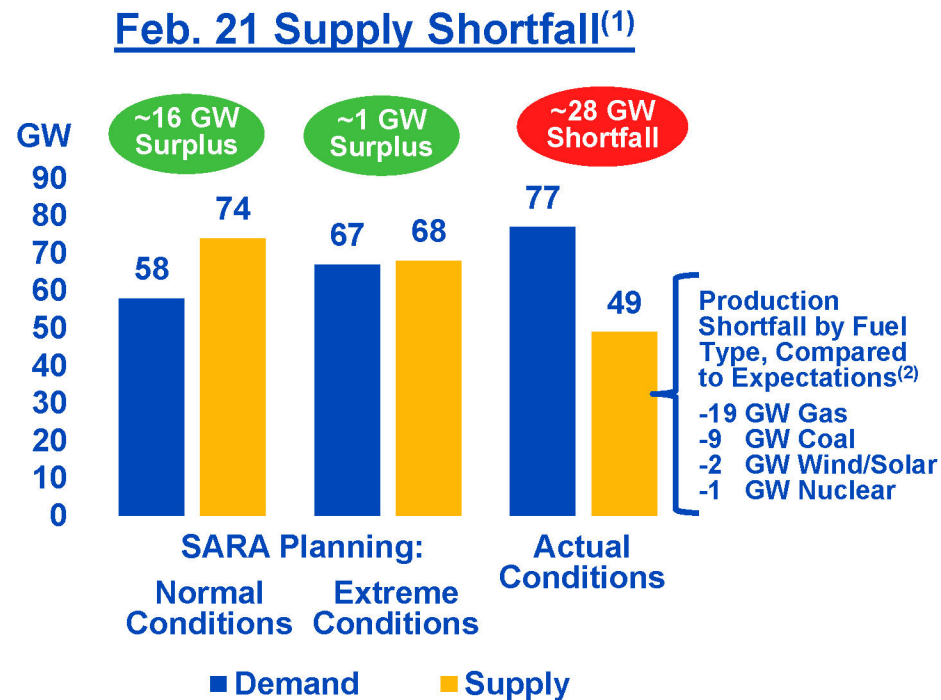
# **ERCOT Market Redesign: NextEra Energy Resources (“NextEra”) Recommendations**

**September 30, 2021**

# ERCOT continues to experience tight reserve margins and needs solutions to encourage investment to address SB 3

## Defining the Problem

- Significant gas generation shortfall due to insufficient fuel supply during Winter Storm Uri
- Lack of proper demand response led to higher than anticipated supply needs
- Renewables provide great cost benefits, but get paid less due to their intermittency, which was observed in winter and summer
- Reserve margins are insufficient to meet demand, highlighting the need to develop policies to support existing generation and encourage new investment



**Without significant policy action, supply shortages will worsen, reserve margins will tighten, and prices will increase**



**NextEra has evaluated a number of market design options and prioritized the following key attributes to develop a proposed solution for ERCOT's energy-only market**

## **Key Attributes of a Successful Market Design**



**Better reliability**



**Improved forward price signals for generation investments**



**Supports technology and market innovation (i.e. batteries, intermittent resource firming, demand response, and distributed generation)**



**Sufficient revenues for dispatchable generation**



**Fosters market-driven solutions, allowing stakeholders to respond to incentives and drive results**



**Enhanced weatherization and improved forced outages rates**

# Three definitive actions should help resolve market issues and deliver on SB 3 initiatives

## Market Redesign Solutions

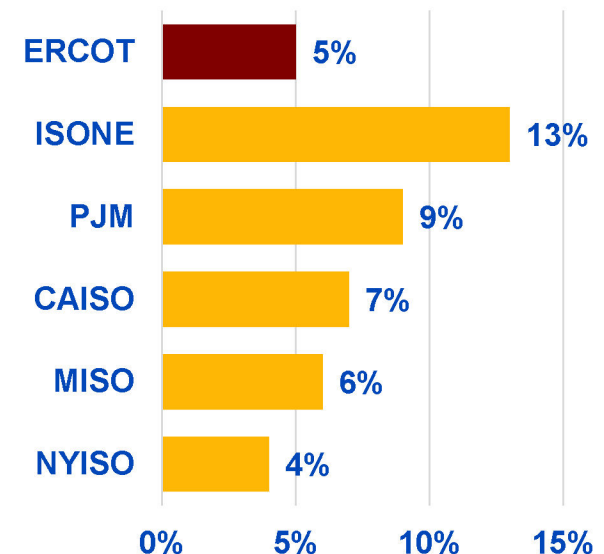
- 1 Expand Demand Response programs and initiatives**
- 2 Create a cost recovery mechanism for on-site fuel for dispatchable generation**
- 3 Reform Operating Reserve Demand Curve (“ORDC”) and create Contingent Reserves**
  - Lower the price cap
  - Modify the shape of the curve
  - Create new “Contingent Reserve” ancillary service

**We believe demand response (“DR”) is an under-utilized asset in ERCOT that should help improve operating reserves in extreme conditions and lower market costs**

## **1 Demand Response**

- **With investment in DR technology and improved communication, ERCOT can better manage its load demands, especially in extreme events**
- **Expanded DR programs will provide load with more options to offset the added cost of higher reliability**
- **We recommend:**
  - 1 Expanding DR programs offered by TDSPs to allow for greater participation**
  - 2 Integrating and investing in smart thermostats, energy storage, and distributed generation**
  - 3 Creating market incentives that allow customers to benefit from real-time prices by shifting load to lower cost periods**
  - 4 Improving DR deployment planning in advance of potential events**

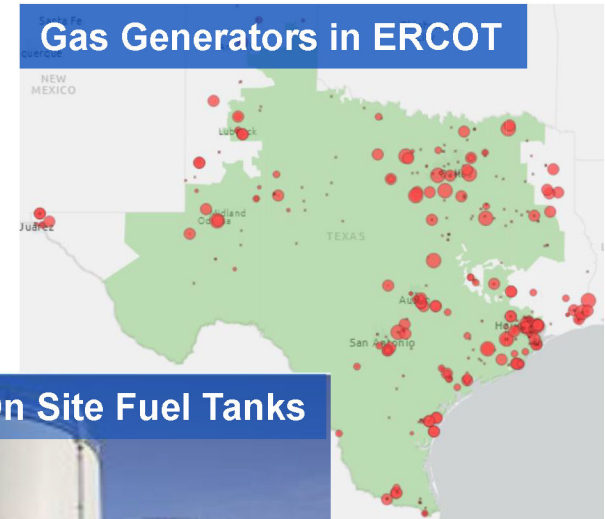
**Demand Side Management  
% of Peak Demand by ISO**



**We believe incentivizing dispatchable generation to secure on-site fuel should improve the supply stack and allow ERCOT to mitigate future extreme winter events**

## **2 On-Site Fuel Cost Recovery**

- Lack of adequate gas supply led to a number of outages, derates and failures to start in the ERCOT gas fleet during Winter Storm Uri
- To mitigate against a future extreme winter event, dispatchable generation should install and maintain ~3 days of on-site fuel supply to be utilized during extreme conditions
- The expected upfront capital investment of building on-site storage facilities is ~\$1-\$2 B across ERCOT's natural gas generation fleet



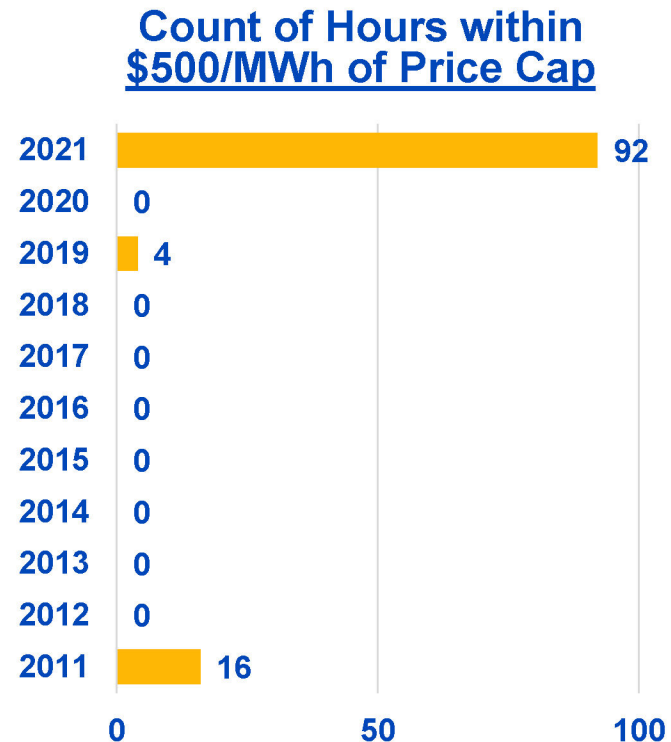
**Dispatchable generation should be provided an incentive payment<sup>(1)</sup> to secure on-site fuel, subject to refund for failure to perform**



# Modifying the ORDC to provide more frequent, higher price signals and lowering the price cap should strengthen support for existing and new generation

## 3a ORDC Modifications

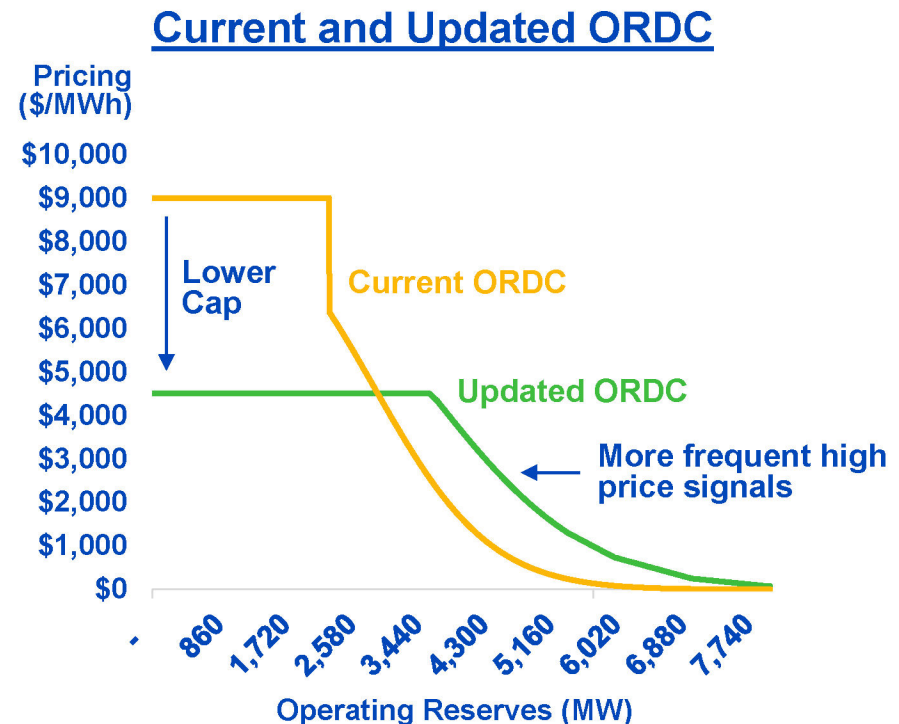
- The price cap was, in part, designed to convince generators that sufficient revenue streams exist in the market to support new and existing dispatchable generation
  - For example, selling generation at \$9,000/MWh for 8-10 hours per year could yield sufficient revenue to support a gas peaker
- However, over the past 10 years, the price cap was reached only three times (2011, 2019, 2021)
- As a result of the infrequent and intermittent nature of the price cap occurring, there is currently not a sufficient cash flow stream to support dispatchable generation



**By lowering the price cap to \$4,500/MWh and modifying the shape of the ORDC, it should provide higher prices more frequently to prevent dispatchable generation from retiring**

### **3a** ORDC Modifications

- With a lower price cap and a modified shape, the ORDC should flatten, resulting in higher prices, even at healthier operating reserve levels
- Higher prices should occur with increased frequency, providing generators with greater security around cash flow streams
- With improved price security, dispatchable generation can confidently continue to operate their existing generation rather than retire



**ORDC reforms should help both generators and consumers and allow ERCOT to pivot away from its current crises-based model**

**We believe creating a new ancillary utilizing ERCOT's energy-only market design could provide sufficient price signals to encourage investment in new generation**

### **3b Contingent Reserve Ancillary**

- **Contingent Reserve procurement will set aside dispatchable generation to act as an insurance policy and be deployed when market conditions are tight**
  - Volume of Contingent Reserves will be sized to reflect supply shortfall on an extraordinary day
  - Any dispatchable resources – including storage – would be eligible to participate
- **By excluding these reserves from the supply stack, prices will increase, providing visibility and support for forward energy prices**
- **Increased forward energy contract prices should signal sufficient cash flow to economically support new dispatchable generation, incenting investment**

#### **HOW DOES IT WORK?**

##### **Step 1**

**ERCOT identifies annual volume needed for Contingent Reserve procurement providing flexibility as new storage technologies emerge**

##### **Step 2**

**ERCOT procures Contingent Reserves on a forward basis through multiple central auctions – lowest cost wins**

##### **Step 3**

**Existing generation competes to supply Contingent Reserve**

##### **Step 4**

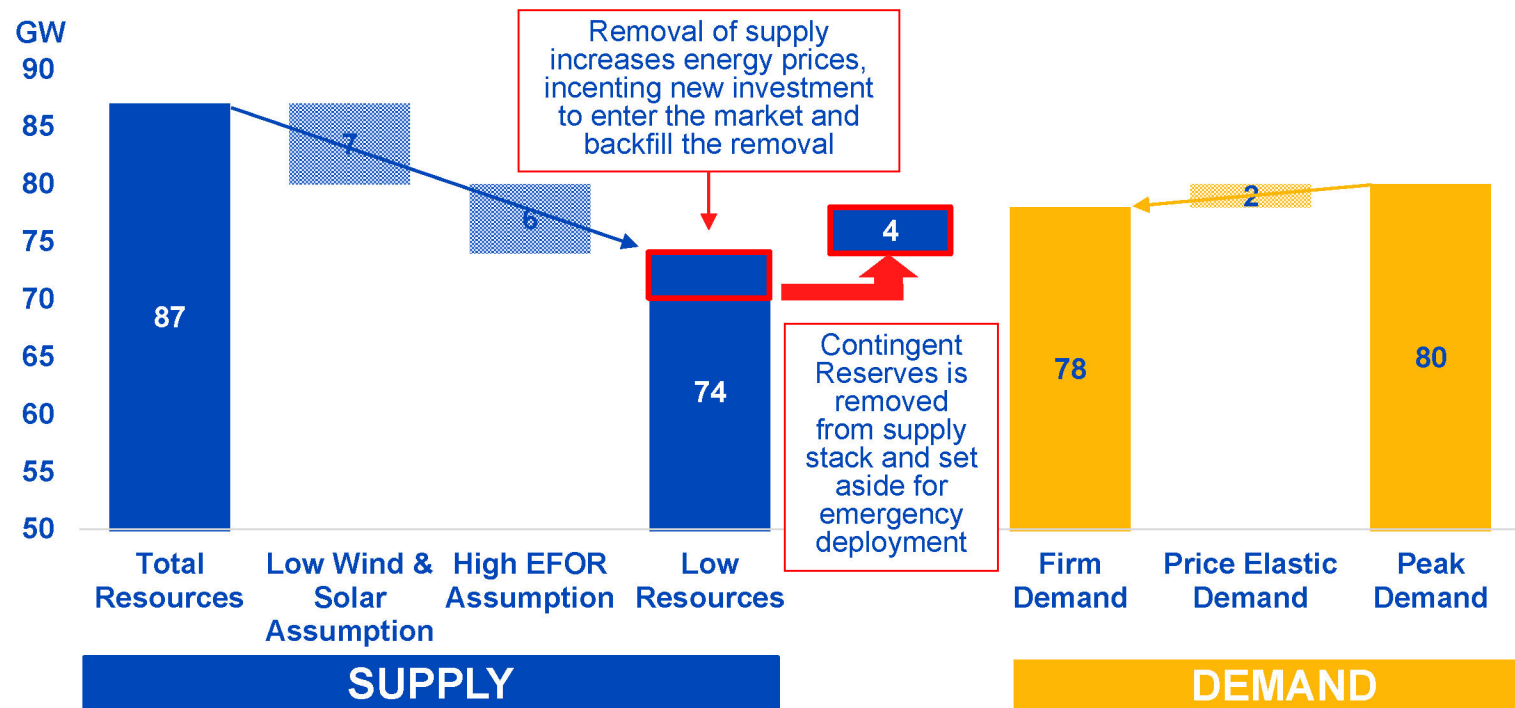
**Contingent Reserves are withheld from the energy market and only utilized during scarcity conditions**

**Contingent Reserve Ancillary is not a capacity market and provides ERCOT the flexibility to alter the volume as reliability improves**



**By removing Contingent Reserves from the supply stack, forward energy prices should increase providing support for new generation investment**

### 3b Volume of Contingent Reserve Procurement (August 2021 Seasonal Assessment of Resource Adequacy Example)



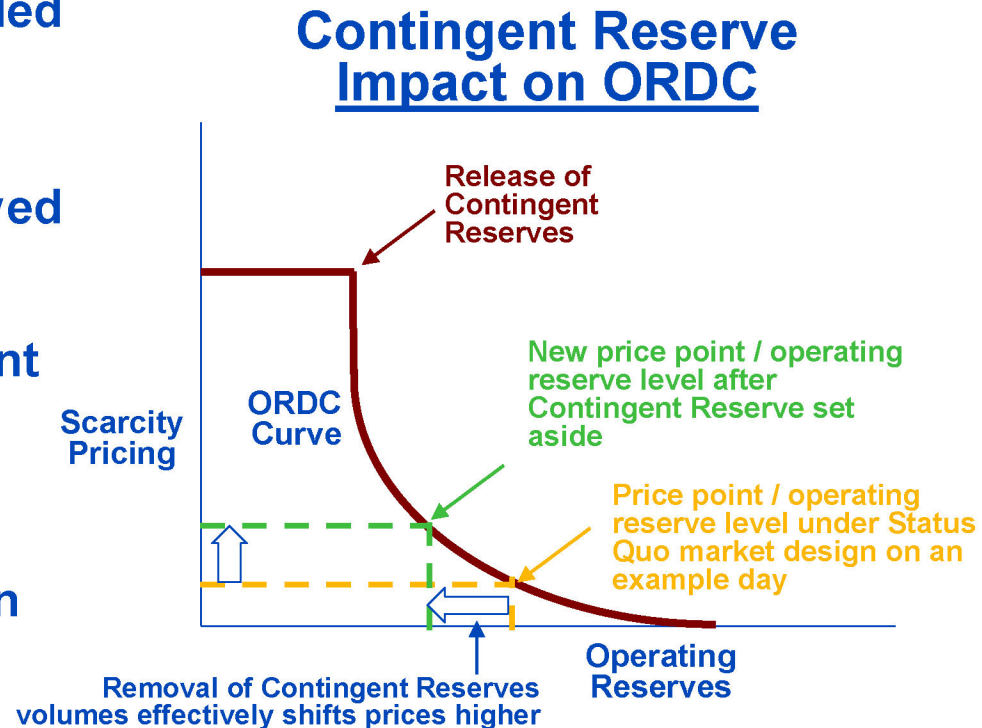
**The volume of the forward procurement will be dynamic based on firm demand and mix of dispatchable and intermittent resources in the market**



# Withholding Contingent Reserves from the existing supply stack should bolster both spot and forward energy prices

## 3b Contingent Reserve: Impact on ORDC

- Contingent Reserves are excluded from operations, which should shift the ORDC, raising prices
- Contingent Reserves act as an insurance policy and are deployed to meet energy demand when market conditions are tight
- Prices should hold as Contingent Reserves are released, but will increase once Contingent Reserves are exhausted
- Implementation of Contingent Reserves should be evaluated in combination with lowering the price cap to maximize benefits



ORDC reform coupled with Contingent Reserves could provide price clarity to maintain existing generation and encourage new investment

**ORDC modifications combined with the Contingent Reserve proposal will increase energy prices, maintain existing generation, and attract new investment**

## **Market Redesign Comparison (2026)** (NextEra Analysis)

	<b>Status Quo</b>		<b>Contingent Reserves</b>
	Current ORDC	Revised ORDC	Revised ORDC
<b>2026 Average Energy Price (\$/MWh)</b>	~\$35	~\$35	~\$40
<b>Peaker Net Cost (\$/kW-mo)</b>	~(\$6)	~(\$6)	~(\$6)
<b>Peaker Net Margin (\$/kW-mo)</b>	~\$4	~\$4	~\$6
<b>2021-2026 Dispatchable Gen Build (GW)</b>	9 GW	9 GW	11 GW
<b>2026 Dispatchable Reserve Margin (%)</b>	99%	99%	102%
<b>2026 Loss of Load Expectations</b>	0.26	0.26	0.11
<b>Contingent Reserve Payment (\$B)</b>	--	--	\$0.3

**The combination of NextEra's proposed solutions should improve reliability, support dispatchable generation and address ERCOT's winter and summer needs**

## Summary of Proposed Solutions

	Summer or Winter Benefit	Support Existing Generation	Encourage New Investment
DR Incentives	Both		✓
On-Site Fuel	Winter	✓	
ORDC Reform + Contingent Reserve	Both	✓	✓

# Implementation of three recommended definitive actions will resolve market issues and deliver on SB 3 initiatives

## Market Redesign Solutions

Market Issues	Solutions
<ul style="list-style-type: none"><li>Lack of demand response led to higher than anticipated supply needs</li></ul>	<b>1</b> Expanded demand response will support the proper link between reliability needs and reliability beneficiaries, and incentivize more elastic demand to lower reliability costs
<ul style="list-style-type: none"><li>Significant gas generation shortfall due to insufficient fuel supply during Winter Storm Uri</li></ul>	<b>2</b> Require on-site fuel for dispatchable generation and provide cost recovery
<ul style="list-style-type: none"><li>Reserve margins are insufficient to meet demand, highlighting the need to develop policies to support existing generation and encourage new investment</li></ul>	<b>3</b> Contingent Reserves combined with a modified ORDC will provide the market with more consistent and adequate price signals for existing generation and dispatchable investment









**Any market redesign should not penalize low-cost non-dispatchable generation which would undermine financial markets, hurt investment, drive up prices, and worsen reliability**

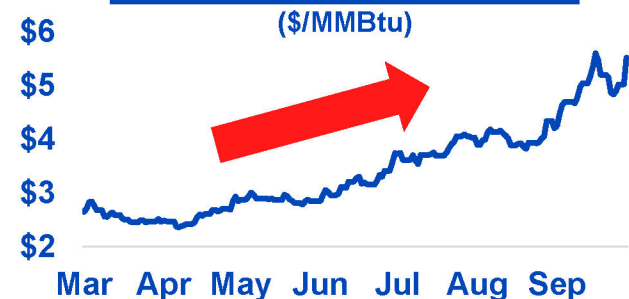
## Market Benefits and Cost

- **Dispatchable generation and renewables are different products**
  - Dispatchable generation gets higher revenue for their reliability, resulting in higher costs for load
  - Renewables reduce cost, but are intermittent and thus get paid less and are not recipients of scarcity pricing when they don't run
- **Load benefits from both forms of generation – reliability of dispatchable generation and significantly reduced costs due to renewables**
- **Any new market design that increases costs to improve reliability should be paid by the beneficiary receiving the benefits**
- **Renewables should not be charged a dispatchable cost when they are not a dispatchable resource – doing so would drive the lowest cost generation out of the market at a time when gas prices are rising**

### Potential Cost per MWh Mid-2020s<sup>(1)</sup>

	(\$/MWh)
Near-Firm Wind	\$15 - \$20  \$25 - \$35
Near-Firm Solar	\$25 - \$30  \$30 - \$40
Natural Gas	 \$30 - \$50
Existing Nuclear	 \$35 - \$50
Existing Coal	 \$35 - \$50
 Storage Adder	

### Rising Spot Gas Prices

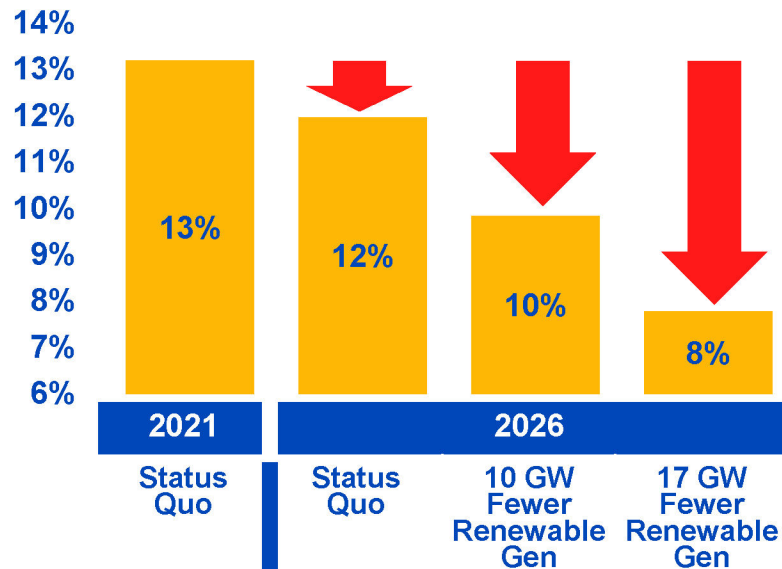


**As any new market design solution will result in higher system costs, it is even more important to encourage renewable growth to offset this cost**

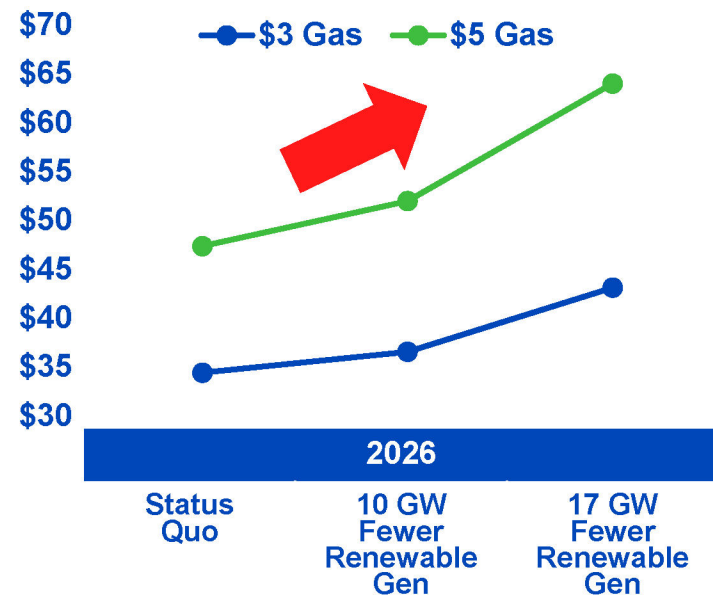
**Allocating market costs to renewables would not only be discriminatory, but it would also lead to losing ~10-17 GW of current and future renewable generation**

## Impact of Cost Allocation to Renewables

Reserve Margin Forecast (%)



2026 Energy Prices (\$/MWh)



**Assigning reliability or other market costs to renewables will increase the generation shortfall, reduce reserve margins and increase prices**

# Penalizing renewables not only harms generator owners, but it also damages the financial institutions that invest in them

## Financial Markets

- Financial institutions have large investments in ERCOT renewables
- Winter Storm Uri had negative impacts on their interests, and allocating costs to renewables will create further financial damage
- Changing the rules on past investments will undermine market certainty and lead to a loss of investor confidence
- Texas will lose their attractiveness as a place to invest and deter future capital lending in the state



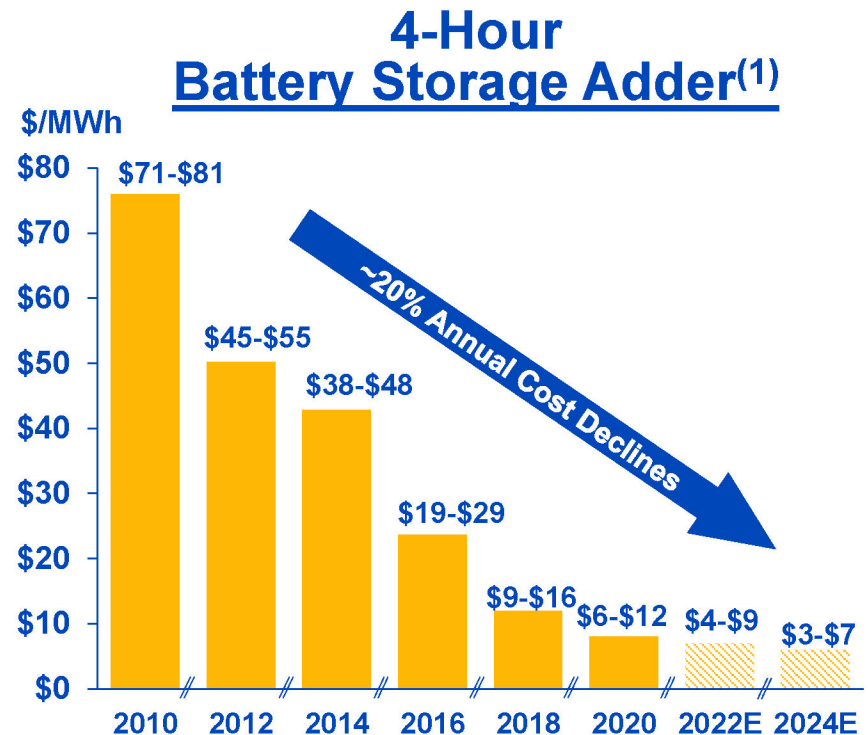
**Allocating costs to renewables will worsen investor confidence and have downstream impacts on new generation investment**



**NextEra's market design will alleviate the near-term reliability problem until storage is more readily available to provide increased reliability at a lower cost when paired with renewables**

## Energy Storage Benefits

- Transportation sector is driving battery storage R&D; power sector stands to benefit from the resulting technology and cost improvements through the next decade
- Storage add-ons at new and existing renewable sites will allow for low-cost, near-firm renewable power
- Market reforms must remain technology agnostic if ERCOT is to benefit from these expected technology improvements



**Storage duration and efficiency is expected to continue to improve over the next few years providing a low-cost near-firm resource when paired with renewables**



# Appendix

# Forward procurement of Contingent Reserves should extend out as far as practical to signal to the market the need for new investment

## 3 Contingent Reserve Attributes

### Details

### Benefits

	Details	Benefits
Auctions	<ul style="list-style-type: none"><li>• Volume procured for a future season through ERCOT-administered auctions</li><li>• Auctions held after release of CDR and SARA reports where a fraction of the volumes are procured up to 32 months in the future with slices of the target procured each auction</li></ul>	<ul style="list-style-type: none"><li>• Competitive auctions ensure ISO is procuring the least cost supply</li><li>• Procurement target can be updated to reflect latest firm load forecast and reliable supply available without concern of over-procuring</li></ul>
Suppliers	<ul style="list-style-type: none"><li>• Contingent Reserve suppliers must pre-qualify prior to auction with certain generation characteristics:<ul style="list-style-type: none"><li>– Start up time, minimum run-time, ramp rates, weatherization requirements</li></ul></li><li>• Performance penalties for non-performance associated with accepting Contingent Reserve obligation</li><li>• Contingent Reserve obligation awarded to the supplier with the lowest offer price will either have the lowest go-forward costs or smallest foregone energy margin</li></ul>	<ul style="list-style-type: none"><li>• Provides ERCOT with a reserve of dependable generation to be used in an extreme weather scenario</li><li>• ISO establishes performance criteria but does not discriminate by technology<ul style="list-style-type: none"><li>– Allows for market innovation</li></ul></li><li>• Competitive auction ensures cost of program is minimized</li><li>• Market based clearing price not reliant upon administratively set parameters</li></ul>

# Contingent Reserves seeks to bolster the energy-only market's ability to support ERCOT's reliability goals with the least reliability payments

## 3 Contingent Reserve Attributes

### Current Situation

### Benefits of Contingent Reserves

Energy-Only Market	<ul style="list-style-type: none"><li>• Under normal weather conditions, renewable generation depresses energy prices and net margins for dispatchable resources needed to maintain reliability in low renewable resource scenarios</li><li>• Rare scarcity price signals in spot market has not translated to high forward prices sufficient to incent sufficient new investment to maintain a reliable system</li></ul>	<ul style="list-style-type: none"><li>• Revenues from this ancillary service would act as a supplemental payment to generators with little to no expectation of revenues during typical weather conditions and would stave off their retirement</li><li>• Excluding contingent reserves from the energy market, bolsters spot energy prices and forward energy contract prices through more regular scarcity price signals</li><li>• Increased energy price sufficient to support new investment</li><li>• Forward procurement sends a price signal to support forward market valuations, increasing hedging opportunities for new investments and lowering costs</li></ul>
Cost	<ul style="list-style-type: none"><li>• Extreme scarcity pricing punishes insufficiently hedged retailers</li><li>• Weather contingent ISO reserve procurements (Non-Spin) raises uncertainty and cost to supply</li></ul>	<ul style="list-style-type: none"><li>• Cost of Contingent Reserves allocated to load based on coincident peak share net of registered demand response<ul style="list-style-type: none"><li>– Cost avoidance will provide incentives for demand response adoption</li></ul></li><li>• Auctions provide price visibility on costs</li><li>• Contingent Reserves eliminate need for short term weather contingent reserves</li></ul>

## **EXECUTIVE SUMMARY**

The Electric Reliability Council of Texas (“ERCOT”) continues to experience tight reserve margins and needs solutions to encourage investment to address Senate Bill (“SB”) 3. However, penalizing low-cost non-dispatchable generation would undermine financial markets, hurt investment, drive up prices, and worsen reliability by taking the lowest cost power off the grid. Allocating market costs to renewables would not only be discriminatory but would also lead to losing approximately 10-17 GW of current and future renewable generation.

NextEra has evaluated a number of market design options and prioritized the following key attributes to develop a proposed solution for ERCOT’s energy-only market:

- Key attributes of a successful market design will include:
  - Better reliability
  - Improved forward price signals for generation investments
  - Sufficient revenues
  - Enhanced weatherization and improved forced outage rates
  - Better visibility of day-ahead and intra-day generation availability for operational planning
  - Supports technology and market innovation (e.g., batteries, intermittent resource firming, demand response, and distributed generation)
  - Fosters market-driven solutions, allowing stakeholders to respond to incentives and drive results

To achieve these results, NextEra proposes a market redesign framework that would include the following three definitive actions to help resolve market issues:

- (1) Expand Demand Response programs and initiatives
- (2) Create a cost recovery mechanism for on-site fuel for dispatchable generation, and
- (3) Reform Operating Reserve Demand Curve (“ORDC”) and create Contingent Reserves

- Lower the price cap
- Modify the shape of the curve
- Create new “Contingent Reserve” ancillary service

Taking each of these suggested actions in turn:

- First, Demand Response (“DR”) is an under-utilized asset in ERCOT that should help improve operating reserves in extreme conditions and lower market costs. With investment in DR technology and improved communication, ERCOT can better manage its load demands, especially in extreme events. NextEra recommends:
  - Expanding DR programs offered by Transmission and Distribution Service Providers (“TDSP”) to allow for greater participation,
  - Integrating and investing in smart thermostats, energy storage, and distributed generation,
  - Creating market incentives that allow customers to benefit from real-time prices by shifting load to lower cost periods, and
  - Improving DR deployment planning in advance of potential events.
- Second, incentivizing dispatchable generation to secure on-site fuel should improve the supply stack and allow ERCOT to mitigate future extreme winter events.
- Third, modifying the ORDC to provide more frequent higher price signals and lowering the price cap should strengthen support for existing and new generation.
  - As a result of the infrequent and intermittent nature of the price cap occurring, there is currently not a sufficient cash flow stream to support dispatchable generation.
  - By lowering the price cap to \$4,500/MWh and modifying the shape of the ORDC, it should provide higher prices more frequently to prevent dispatchable generation from retiring.
  - Creating a new “Contingent Reserve” ancillary utilizing ERCOT’s energy-only market design could provide sufficient price signals to encourage investment in new generation.
    - Step 1: ERCOT would identify an annual volume needed for Contingent Reserve procurement
    - Step 2: ERCOT procures Contingent Reserves on a forward basis through multiple central auction, with lowest cost winning.

- Step 3: Existing generation would compete to supply Contingent Reserve.
- Step 4: Contingent Reserves would be withheld from the energy market and only be utilized during scarcity conditions.

The combination of NextEra's proposed solutions should improve reliability, support dispatchable generation, and address ERCOT's winter and summer needs.